

Remarks

Claims 1-10, 12, 13, and 15-21 are pending in this application. Claims 17-21 have been withdrawn from consideration. This Response amends claim 1 and cancels claim 12.

Claims 1-10, 12, 13, 15, and 16 have been rejected for obviousness. This is the only remaining rejection in this application. All other rejections have been withdrawn. Applicants respectfully request reconsideration of the rejected claims in light of the above amendment and the following remarks.

Support for the Amendment

Claim 1 has been amended to recite the weight ratio of the polyarylene oxide polymer to the styrenic blocks, and to incorporate the peel strength provided in original claim 12. Support for this amendment is found, for example, on page 8, lines 4-6. No new matter is added by this amendment.

§ 103 Rejections

Claims 1-10, 12, 13, 15, and 16 stand rejected under 35 USC § 103(a) as being unpatentable over Gehlsen et al. (U.S. Patent No. 6,103,152). Applicants respectfully traverse this rejection as applied to the amended claims.

The present invention features a foamed pressure sensitive adhesive (PSA) article comprising a polymeric mixture containing at least one styrenic block copolymer and at least one polyarylene oxide polymer. In a previous Amendment dated March 21, 2003, Applicants amended claim 1 to recite that the foamed PSA article has a gel content of less than 25%. Applicants explained that this amendment incorporated the characteristic that the material has relatively little, or even no crosslinking. Applicants argued that this feature distinguishes the Gehlsen foams, which require extensive crosslinking in order to achieve high cohesive strength and or high modulus. The Examiner, however, asserted that inclusion of this feature in the claims did not overcome the § 103 rejection, because Gehlsen teaches that crosslinking is optional. Specifically, the Examiner stated:

Gehlsen expressly teaches that "In some cases, e.g., where high

crosslinked" (column 2, lines 5-7). As such, clearly Gehlsen's teaching shows that crosslinking is an optional mean to improve the aforementioned properties, and it would have been obvious to one of ordinary skill in the art to lightly crosslink (i.e., low gel content) the adhesive article, if necessary, since high crosslinking density would be inherently detrimental to its pressure sensitive adhesive property.

The passage from Gehlsen cited by the Examiner (i.e. col. 2, lines 5-7) clearly teaches that the Gehlsen foams are to be crosslinked in situations where high cohesive strength or high modulus is desired. Although Gehlsen teaches that this crosslinking is optional, for example it would not be needed in situations where high cohesive strength and high modulus are not desired, Gehlsen does not teach that high cohesive strength and/or high modulus can be achieved without crosslinking or even with "light" crosslinking as suggested by the Examiner, and Gehlsen fails to describe any means for obtaining these properties without extensive crosslinking.

A careful review of the data present by Gehlsen clearly shows that the Gehlsen foams do not exhibit such properties in the absence of crosslinking. In particular, Applicants would like to draw the Examiner's attention to Examples 62-70 of Gehlsen (cols. 22-23). In these Examples, the Gehlsen foams were prepared without crosslinking (col. 22, lines 14-15) and the shear strength was measured and reported in Table 2 (col. 23, lines 1-15). All of Gehlsen's non-crosslinked foams exhibited low shear strength with failure occurring in less than 200 minutes under a 1000g load at 25°C (see 6th column of Table 2). On the other hand, when the Gehlsen foams are crosslinked, they exhibit a much higher shear strength, with generally no failures occurring within 10,000 minutes (see 12th column of Table 1). Clearly, the data presented by Gehlsen show that Gehlsen's non-crosslinked foams exhibit very low shear strength compared to the crosslinked foams. Only when Gehlsen's foams were substantially crosslinked did they exhibit a high shear strength. Thus, Gehlsen describes foams that are crosslinked with high shear strength, and foams that are non-crosslinked with low shear strength, but Gehlsen does not describe a foam which is substantially non-crosslinked yet has high shear strength.

In contrast, the present invention provides foams that have both a low gel content (i.e. relatively little crosslinking) and high sheer strength. In particular, independent claims 13 and 16 recite a foam with gel content less than 25% that has a sheer holding

power of at least 3000 minutes at 70°C as determined by ASTM 3654 with a 500g load. As discussed above, the only Gehlsen foams that exhibited high shear strength were those that had been extensively crosslinked (see Table 1). Gehlsen's non-crosslinked foams (Examples 62-70), shown on table 2 all exhibited a low shear strength. Indeed, the shear strength test used by Gehlsen was performed at 25°C and thus the shear strength of these foams would be expected to be even lower when measured at the higher temperature conditions (70°C) recited in claims 13 and 16. For these reasons, Gehlsen fails to teach or suggest a foamed article that has little or no crosslinking (i.e. low gel content) while still exhibiting the high degree of shear strength recited in claims 13 and 16. Therefore, these claims, and those that depend therefrom, are patentable over the Gehlsen reference.

With respect to claim 1, the other independent claim that stands rejected, Applicants have amended this claim to recite the peel strength provided in original claim 12, and a specific range of weight ratios of the polyarylene oxide polymer to the styrenic blocks. There is nothing in Gehlsen that teaches or suggests this ratio range. On the contrary, Gehlsen describes polyphenylene oxide alloys in a long list of alternative polymers useful as the major component for the polymer matrix (cols. 6 and 7). Since Gehlsen contemplates use of these polymers as the major matrix component, as opposed to a secondary component or additive, one skilled in the art would not have been motivated to use an amount of polyphenylene oxide alloy within the range recited in amended claim 1.

Moreover, although Gehlsen lists polyphenylene oxide alloys and block copolymers of styrene in a long list of matrix polymers, there is nothing in Gehlsen to suggest that these two specific types of polymers should be mixed, much less that such a combination, in the ratio range recited in claim 1, would lead to superior high temperature performance characteristics, high cohesive strength and or high modulus, in the absence of extensive crosslinking.

For these reasons, applicants submit that claim 1, and those claims that depend from claim 1, are also patentable over Gehlsen. Thus, Applicants respectfully submit that the rejection of claims 1-10, 12, 13-15, and 16 under 37 U.S.C. §103 as being unpatentable over Gehlsen has been overcome and should be withdrawn.

Conclusion

In view of the foregoing amendments and remarks, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested.

Allowance of claims 1-10, 12, 13, 15, and 16, as amended, at an early date is solicited.

All communications in this case should be directed to the undersigned. If the Examiner believes a telephone discussion would be helpful to resolve any outstanding issues in this case, the Examiner is encouraged to call the undersigned at the number listed below.

Respectfully submitted,

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Date

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